UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/888,591	06/26/2001	Hans-Josef Sterzel	51522	8631

7590 10/27/2003

Keil & Weinkauf
1350 Connecticut Ave., N.W.
WASHINGTON, DC 20036

EXAMINER	
QUAN, ELIZABETH S	

ART UNIT	PAPER NUMBER
1743	6

DATE MAILED: 10/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/888,591	STERZEL ET AL.	
	Examiner	Art Unit	
	Elizabeth Quan	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-11 is/are pending in the application.

4a) Of the above claim(s) 11 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-10 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) 1-11 are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-10, drawn to a process for the combinatorial production of material samples, classified in class 436, subclass 180.

II. Claim 11, drawn to an apparatus for carrying out the combinatorial production of material samples, classified in class 422, subclass 100.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process as claimed can be practiced by another apparatus, such as a manually operated pipette or ink-jet printer. The apparatus as claimed can be used to practice another and materially different process, such as dispensing solids onto the substrate or creating the materials of the same composition in all surface regions of the substrate.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Herbert B. Keil on 9/8/2003 a provisional election was made with traverse to prosecute the invention of I, claims 1-10. Affirmation of this election must be made by applicant in replying to this Office action. Claim 11 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

9. Claims 2, 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Referring to claim 2, it is unclear what is being charged vertically from above.

11. Referring to claim 8, it does not make sense that the substrate is laid on a matrix plate with holes with the dispensing taking place into the holes. There is either a missing process step wherein the substrate is laid on a matrix plate and flipped over for dispensing or the claim

actually means that the matrix plate is laid on the sheet-like substrate instead. Amendments to correct the claim according to the latter possibilities may be considered new matter, as they are not supported by the specification. For examination purposes, the claim has been interpreted as the matrix plate is laid on the sheet-like substrate.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1, 2, 5-10 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,985,356 to Schultz.

Schultz discloses a method for the preparation and use of a substrate with an array of diverse materials in predefined regions (ABSTRACT; COL. 3, lines 12-21; COL. 11, lines 42-44). Essentially, any conceivable substrate can be employed (COL. 11, lines 44 and 45). The substrate can be organic, inorganic, biological, non-biological, or a combination of any of these, in the form of a sheets, particles, strands, precipitates, gels, tubing, spheres, containers, capillaries, pads, slices, films, plates, slides, etc. (COL. 11, lines 44-49). The substrate may be divided into individually defined positions spatially delimited from one another by distance, dimples, wells, raised regions, etched trenches, etc. to prevent reactant components in the individual reaction regions from moving or diffusing into other reaction regions (COL. 5, lines 54-64; COL. 10, lines 7-23; COL. 11, lines 53-55; COL. 13, lines 24-42).

Various dispensers may deliver suspensions of powders of the elements of the periodic table (COL. 4, lines 12-17; COL. 10, lines 37-67; COL. 11, lines 1-24; COL. 15, line 7-COL. 18, line 19; COL. 20, line 18-COL. 26, line 51). For example, an RF magnetron sputter gun may deliver copper oxide, calcium oxide, and lead oxide, and an ink-jet printer may deliver styrene, acrylonitrile, and benzoyl peroxide in toluene solutions (COL. 31, line 39-COL. 33, line 51). Other dispensers include micropipettes, electrophoretic pumps, sputtering systems, sprayers, lasers, beams, etc. (COL. 4, lines 15-17; COL. 16, lines 37-59). A frame of reference common to the delivery instrument and substrate provides for consistent deposition of droplets at precisely defined regions by the dispenser (COL. 22, line 13-COL. 24, line 52). Additionally, masks or other physical means may be employed for dispensing drops onto the same point of the substrate (FIGS. 2 and 3; COL. 11, lines 9-34; COL. 18, line 20-COL. 20, line 12). The mask has holes that align with defined positions on the substrate to accurate dispense droplets in a certain position (FIGS. 2 and 3; COL. 17, line 59-COL. 20, line 17). The mask can be made of any suitable material, including polymers, silicon metals, inorganic glasses, etc. (COL. 18, lines 25-27). The reactant components at least partially dry on the substrate prior to the removal of the mask in preparation for screening since the substrate may be exposed to ambient air or other gases or heated during or after dispensation and the flow rate of the dispenser may be adjusted such that droplets dry immediately upon contact with the substrate surface (COL. 25, line 12-COL. 26, line 27; COL. 32, line 9-61; COL. 35, line 64-COL.36, line 56; CLAIMS 1 and 14-16). Note: Applicant's specification on page 4, lines 30-32 require only partial drying. The control of droplet size may be accomplished by various techniques (COL. 24, lines 36 and 37). In one example, 5 microliters of a reactant is added to the substrate (COL. 33, lines 40-45). Tables III-

VI show reactants delivered to the substrate in amounts from 1 to 1000 microliters (COLS. 33-38). The substrate is arranged horizontally, and the dispensing device vertically charges the substrate, such that the dispensing direction is in a plane perpendicular to the substrate (COL. 11, lines 32-34; COL. 22, lines 49-51; COL. 23, lines 18-20 and 60-67; COL. 24, lines 1-23). The products present at individually defined positions of the substrate are analyzed for a desired property using physical and/or chemical methods (COL. 26, line 52-COL. 31, line 38).

In one embodiment, a first component of a first material is delivered to a first region on the substrate, and a first component of a second material is delivered to a second region on the same substrate (COL. 3, lines 35-38). Subsequently, a second component of the first material is delivered to the first region on the substrate, and a second component of the second material is delivered to the second region on the substrate (COL. 3, lines 39-42). The process is optionally repeated with additional components to form a vast array of components at predefined, known locations on the substrate (COL. 3, lines 42-44). The components are simultaneously reacted to form at least two materials (COL. 3, lines 45 and 46). The components can be sequentially or simultaneously delivered to predefined regions on the substrate in any stoichiometry, including a gradient of stoichiometries, using any of a number of different delivery techniques (COL. 3, lines 46-50).

In another embodiment, at least two different arrays of materials are formed by delivering substantially the same reaction components at substantially identical concentrations to reaction regions on both first and second substrates and, subsequently, subjecting the components on the first substrate to a first set of reaction conditions and the components on the second substrate to a second set of reaction conditions (COL. 3, lines 51-58). The effects of various reaction

parameters can be studied on many materials simultaneously and optimized (COL. 3, lines 58-61). Reaction parameters include reactant amounts, reactant solvents, reaction temperatures, reaction times, pressures and atmospheres in which reactions are conducted, quenching rates of reactions, order in which reactants are deposited, etc. (COL. 3, lines 61-67).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,985,356 to Schultz in view of U.S. Patent No. 5,985,214 to Stylli et al. or U.S. Patent No. 5,226,462 to Carl.

Schultz does not explicitly disclose that dispensing is carried out by displacing movable plungers in the dispensing device. It is well known to use dispensing devices with plungers, as demonstrated by Stylli et al. that disclose nanoliter dispensers may be operated by a piston driven by a motor or gas bottle (COL. 16, lines 11-28; COL. 60, lines 43-48) and Carl that disclose a dispenser in which dispensing is carried out by pistons and cylinders in the dispenser for producing accurate, precise, and adjustable amounts of liquid. Therefore, it would have been obvious to one having ordinary skill in the art to carry out the process of Schultz with a dispensing device operated by a piston driven by a motor or gas bottle for producing nanoliter droplets as taught by Stylli et al. or dispenser in which dispensing is carried out by pistons and cylinders in the dispenser for producing accurate, precise, and adjustable amounts of liquid as taught by Carl.

18. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,985,356 to Schultz in view of U.S. Patent No. 5,985,214 to Stylli et al. or U.S. Patent No. 6,508,984 to Turner et al.

Schultz does not explicitly disclose that the dispensable material components are dispensed and mixed on an auxiliary substrate prior to being taken up by a dispensing device and dispensed onto the substrate. Stylli et al. disclose generating daughter plates from master plates of stock solutions using a dispensing device (FIGS. 9A, 12A, and 12B; COL. 4, lines 8-11; COL. 5, lines 4-8; COL. 12, lines 5-31 and 62-67; COL. 13, lines 1-5; COL. 16, lines 4-8; COL. 31,

lines 57-61; COL. 50, line 54-COL. 51, line 8). The daughter plate may contain dilutions of the stock solutions (FIGS. 9A, 12A, and 12B; COL. 4, lines 8-11; COL. 5, lines 4-8; COL. 12, lines 5-31 and 62-67; COL. 13, lines 1-5; COL. 16, lines 4-8; COL. 31, lines 57-61; COL. 50, line 54-COL. 51, line 8). The contents of the daughter plate may be transferred to a sample plate (FIGS. 9A, 12A, and 12B; COL. 4, lines 8-11; COL. 5, lines 4-8; COL. 12, lines 5-31 and 62-67; COL. 13, lines 1-5; COL. 16, lines 4-8; COL. 31, lines 57-61; COL. 50, line 54-COL. 51, line 8). Turner et al. disclose daughter ligand libraries generated from a parent ligand library and metal precursors are added to daughter ligand libraries to generate daughter catalyst libraries in which product libraries may be generated (COL. 14, line 31-COL. 16, line 38). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Schultz to mix the reactants on an auxiliary substrate prior to be taken up by a dispensing device and dispensed onto the substrate as in Stylli et al. or Turner et al. for high-throughput processing and screening of chemical libraries.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. They include one or more limitations in the claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Quan whose telephone number is (703) 305-1947. The examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (703) 308-4037. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Elizabeth Quan
Examiner
Art Unit 1743

eq

Jill Warden
Supervisory Patent Examiner
Technology Center 1700